

## Primary or Secondary Decomposition 141

*Hydrogen* may be viewed as a secondary result; but I incline to the view that it is not so: for, if it were, it might be expected to proportion from the stronger acid, whereas the reverse act. This consideration, with others, also leads me to the effect that muriatic acid is more easily decomposed by the current than water; since, even when diluted with eight times its quantity of the latter fluid, it alone gives way, and remains unaffected.

*Chlorides.*—On using solutions of chlorides in water—namely, the chlorides of sodium or calcium—there was a liberation of chlorine only at the positive electrode, and of hydrogen at the negative electrode, with the oxide of the base, as soda or lime, at the negative electrode. The process of decomposition may be viewed as proceeding in two or three ways, all terminating in the same result. Perhaps the simplest is to consider the chloride as the substance electrolysed, its chlorine being determined to the anode, and its metal passing to the cathode. Ending no more chlorine, it acts upon the water, producing hydrogen and an oxide as secondary results. As the decomposition would detain me from more important matter, and of immediate consequence, I shall defer it for the present. However, of great consequence to state, that, on using the volumetric apparatus, the hydrogen in both cases was definite; the results do not prove the definite decomposition of the acids (which shall be proved elsewhere—524, 529, 549),—not in the slightest degree opposed to such a conclusion, and support the general law.

*Hydriodic acid.*—A solution of hydriodic acid was exactly in the same manner as muriatic acid. When hydrogen was evolved at the negative electrode, in proportion to the quantity of electricity which had, *i.e.* in the same proportion as was evolved by the same from water; and iodine without any oxygen was evolved at the positive electrode. But when diluted, small quantities of hydrogen appeared with the iodine at the anode, the proportion of hydrogen at the cathode remaining undisturbed.

I believe the decomposition of the hydriodic acid in this

be direct, for the reasons already given  
respecting

*i* acid (498,  
490).

*Iodides.*—*h.* solution of iodide of  
potassium being  
xl to the voltaic current, iodine appeared at  
the positive  
e (without any oxygen), and hydrogen with  
free alkali  
negative electrode. The same observations  
as to the